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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/773,422	02/09/2004	Mizuki Muramatsu	00862.023454	6581
5514 7590 01/29/2008 FITZPATRICK CELLA HARPER & SCINTO 30 ROCKEFELLER PLAZA NEW YORK, NY 10112			EXAMINER CHENG, PETER L	
			ART UNIT 2625	PAPER NUMBER
			MAIL DATE 01/29/2008	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/773,422	Applicant(s) MURAMATSU, MIZUKI	
	Examiner Peter L. Cheng	Art Unit 2625	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Specification

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: **COLOR PRINTER AND CONTROL METHOD THEREOF WITH PULSE WIDTH MODULATION FOR TONE CONTROL BASED ON TYPE OF DOCUMENT AND NUMBER OF COLORS PRINTED**, or similar wording;

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

3. Claims 1 and 4 are rejected under 35 U.S.C. 102(a) as being anticipated by **UETSUKI [US Patent Application 2002/0118236 A1]**.

As for claims 1 and 4, UETSUKI teaches, respectively, a color printing apparatus, and a control method of a color printing apparatus having a pulse width modulation means which performs pulse width modulation for tone control

[Fig. 4 “head driver” 111; “Reference numeral 111 denotes a driver for driving the ejection heaters in the print head 9 in accordance with print information signals”; page 4, paragraph 40, lines 6 - 9],

comprising:

first determination means for determining a printing mode of printing data supplied

[UETSUKI teaches that “the host device transmits commands containing normal data the leading part of which contains the *type of print media* on which images are to be printed ..., the *size of the print media* ..., *printing quality* (draft, high quality, intermediate quality, emphasis on particular colors, monochrome/color, or *the like*), a sheet feeding source ..., enabling or disabling of automatic determination of an object, and other data”; **page 4, paragraph 42, lines 5 – 16.**

A “printing mode” is determined as including the *media type*, *media size*, and *printing quality* with these typically being user-selectable from a printer driver user interface. The “printing mode”, in turn, determines various printer engine operating parameters, as noted below];

second determination means for determining whether the printing data is to be processed as single-color data

[As noted, UETSUKI *includes* the determination of “monochrome/color” data (from the host device) as part of the “printing quality”];

and setting means for setting a pulse width modulation pattern to be used by said pulse width modulation means in accordance with a determination result of said first and second determination means

[UETSUKI further teaches, “*In accordance with this information, the printing apparatus loads required data from the ROM to perform a printing operation according to this data. Data read out from the ROM includes the number of passes used for multipass printing, the type of a mask used for each pass, driving conditions for the print head (for instance, the shapes of pulses to be applied and application time), the size of ink droplets, ...*”; **page 4, paragraph 42, lines 21 – 28.**

Although not relied upon, **NISHIKORI [US Patent 5,880,751]** teaches how “pulse width modulation” (i.e., the “*driving conditions for the print head (for instance, the shapes of pulses to be applied and application time)*”) for a “pre-heat time” can be used to control the “ink ejection amount” which, in turn, affects the tone of the printed output. The relationship between the pulse time and ink ejection amount is shown in **Fig. 11; col. 3, lines 42 - 45].**

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. Claims 2, 3, 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over **UETSUKI [US Patent Application 2002/0118236 A1]** in view of **SAITOH [US Patent 6,950,207 B1]**, **RODRIGUEZ [US Patent Application 2003/0072576 A1]** and **TRASK [US Patent 5,252,995]**.

Regarding claims 2 and 5, UETSUKI *does not teach*, respectively, the color printing apparatus according to claim 1, and the control method of a color printing apparatus according to claim 4, wherein

said setting means sets a first pulse width modulation pattern

when said first determination means determines that the *printing mode of the printing data is not a predetermined mode that places a great value on thin line reproducibility,*

or when said second determination means determines that *the printing data is to be processed as single-color data,*

**and said setting means sets a second pulse width modulation pattern,
which achieves a smaller developer adhesion amount than the first pulse width modulation pattern,**

when said first determination means determines that the *printing mode is the predetermined mode*

and in addition, said second determination means determines that *the printing data is not to be processed as single-color data.*

SAITOH teaches a printer system comprising “a printer driver that adds drawing-object information for identifying the type of drawing object” to be printed; **abstract, lines 1 –**

3. “Namely, the printer driver 12 determines what the drawing data input from the application 11 is and identifies the drawing object of the drawing data. By adding type code indicating a drawing object to print data that is output to the printer controller 21, it is programmed that the printer controller 21 can determine the type of object to be drawn”; **col. 6, lines 53 – 58**. In one embodiment, “when drawing is executed on the basis of CAD”, *i.e., computer-aided design* “data created by the CAD application, the operator inputs the information to the effect that the drawing data is CAD data to the printer driver 52 via the driver interface 51. Based on this information, the printer driver 52 adds the type code indicating CAD data to the print data and inputs the data to the printer controller 61”; **col. 8, lines 48 – 55**.

Therefore, SAITOH teaches a method of determining whether the “printing mode” is a “*predetermined mode that places a great value on thin line reproducibility*” (*i.e., a “CAD” printing mode*) by means of a “driver interface”; **see also, col. 7, lines 49 – 52**.

With regards to an electrostatic printer, RODRIGUEZ teaches that a “laser light source” which scans the surface of an optical photoreceptor may be “modulated (or pulsed) to illuminate a desired pixel location”; **page 1, paragraph 4, lines 5 – 7**. Furthermore, “the width and number of pulses used to create a pixel may vary from one pixel to another pixel. For example, to produce certain fine details, it may be advantageous to produce relatively narrow pixels. Thus, the duration of the pulse used to create the relatively narrow pixel may be correspondingly short”; **page 1, paragraph 4, lines 10 – 15**.

RODRIGUEZ's teachings of using shorter laser pulse widths to enable the reproduction of fine details would apply to CAD drawings since such drawings contain "fine details". Conversely, when the print data does not contain "fine details", longer pulse widths could be used. In addition, RODRIGUEZ's teachings of using shorter pulse widths to produce "relatively narrow pixels" is analogous to using shorter pulse widths to produce smaller pixels in UETSUKI's inkjet printer.

Therefore, RODRIGUEZ teaches both

said setting means sets a first pulse width modulation pattern

when said first determination means determines that the *printing mode of the printing data is not a predetermined mode that places a great value on thin line reproducibility,*

**and said setting means sets a second pulse width modulation pattern,
which achieves a smaller developer adhesion amount than the first pulse width modulation pattern,**

when said first determination means determines that the *printing mode is the predetermined mode*

Regarding an electrostatic printer, TRASK cites prior art which suggests "that the laser beam, in preparation for deposit of an underprinted toner, be modulated so that the

duration of exposure of the drum surface is less than the duration of exposure during an overprint application. That modulation enables the amount of underprinted and overprinted toners to be matched"; **col. 1, lines 60 – 65.**

Although not relied upon, **HANEDA [US Patent 6,057,866]** similarly teaches decreasing the exposure pulse width for the "underprinted toner". HANEDA's electrostatic printer uses an array of "light emitting elements" [**col. 10, lines 28 - 31**] in place of a laser beam. Like TRASK, HANEDA teaches "when the first color image exposure amount is the same as the second color image exposure amount, the second color toner adhering amount is smaller than the first color toner adhering amount, and a balance between the first color toner and second color toner adhering amounts is lost. Therefore, the first color image exposure pulse width or power is decreased"; **col. 18, lines 56 – 61.**

HANEDA's "first color", as shown in the table in **col. 18, lines 15 – 25**, corresponds to TRASK's "underprinted toner", and HANEDA's "second color" corresponds to TRASK's "overprinted toner".

TRASK teaches, as does HANEDA, that when the "printing data" is not "single-color data" (i.e., color data which requires a superimposition of two or more toners), the underprinted toner is pulse-modulated with less power (i.e., a smaller pulse width) than the overprinted toner. Conversely, if the "printing data" is "single-color data" (i.e., color data which does not require a superimposition of two or more toners), the "sole" first, underprinted toner is pulse-modulated with more power (i.e., a larger pulse width).

Therefore, TRASK teaches both

said setting means sets a first pulse width modulation pattern

when said second determination means determines that *the printing data is to be processed as single-color data,*

**and said setting means sets a second pulse width modulation pattern,
which achieves a smaller developer adhesion amount than the first pulse width modulation pattern,**

said second determination means determines that *the printing data is not to be processed as single-color data.*

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of SAITOH, RODRIGUEZ and TRASK with those of UETSUKI so that

said setting means sets a first pulse width modulation pattern *when the following two conditions, irrespective of each other, occur*

when said first determination means determines that *the printing mode of the printing data is not a predetermined mode that places a great value on thin line reproducibility,*

OR

when said second determination means determines that *the printing data is to be processed as single-color data,*

In addition, it would have also been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of SAITOH, RODRIGUEZ and TRASK with those of UETSUKI so that

and said setting means sets a second pulse width modulation pattern, which achieves a smaller developer adhesion amount than the first pulse width modulation pattern,

when said first determination means determines that *the printing mode is the predetermined mode*

and in addition, said second determination means determines that *the printing data is not to be processed as single-color data.*

Regarding claims 3 and 6, UETSUKI does not teach, respectively, the color printing apparatus according to claim 2, and the control method of a color printing apparatus according to claim 5,

wherein the predetermined mode is a mode for CAD data.

As noted for claims 2 and 5, SAITOH teaches a method of determining whether the "printing mode" is a "*predetermined mode that places a great value on thin line*

reproducibility" (i.e., a "CAD" printing mode) by means of a "driver interface"; **see also**,
col. 7, lines 49 – 52.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

- **NISHIKORI [US Patent 5,880,751]**
- **HANEDA [US Patent 6,057,866]**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Peter L. Cheng whose telephone number is 571-270-3007. The examiner can normally be reached on MONDAY - FRIDAY, 8:30 AM - 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, King Y. Poon can be reached on 571-272-7440. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

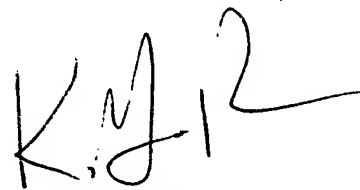
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plc
January 22, 2008

A handwritten signature in black ink, appearing to read 'K. Y. Poon', with a long horizontal flourish extending to the right.

KING Y. POON
SUPERVISORY PATENT EXAMINER